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MANUFACTURE OF ELECTRIC MOTORS IN HUNGARY

Imre Erdos

During the past 5 years, the Hungarian electric motor manufacturing industry has developed many new types of motors, motor type-series, and new fields of application for old types of electrical motors.

After the war, because of the destruction of much of the Ganz Works, the Matyas Rakosi Works began manufacturing small electric motors to satisfy its own needs. The special feature of this series was that it had a permanent cast aluminum housing. These models were even exported in large numbers, but their manufacture has since been discontinued. Experience gained along this line will undoubtedly prove valuable in the future.

A new-model, air-cooled, completely enclosed electric motor which can be easily modified into a crane motor has been developed at the Ganz Electrical Plant.

The Laub Electric Motor Factory is now manufacturing small electric motors with built-in features similar to those which were produced at the Matyas Rakosi Works.

The Siemens Factory is producing motors for small windlasses, and the Dynamo State Enterprise is producing much-needed electrical powered hand tools. A new series of 12 dc motors of 10-200 hp is being manufactured at the Ganz factory. These are capable of 35% more production than the old motors of the same weight.

Hydraulic turbogenerators and large motors are being successfully produced, using domestic materials wherever possible, even if changes in construction are necessary. One such change is the use of domestic Siemens-Martin steel, which is somewhat softer than the chrome-nickel-molybdenum alloy imported before the war.

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Numerous large motors are under construction at the Ganz Electrical Plant. A 3,000 hp, 3,000 v, 365 rpm induction motor is being built for one rolling mill, and work has begun on a 7,000/12,500 hp dc reversible motor for another rolling mill. Three groups of machines with Ward-Leonard motor dynamos rated at 2,450 hp, 5,700 v are being built for mine transport. An Igner motor dynamo and a 650 kw dc twin motor are being built for a foreign-make pipe-draw-bench. An 1,100 kw, two-pole, 3,000 v double rotor squirrel cage motor for a boiler injector is also being built at the plant.

Two 1,000-cycle, 300 kva, 3,000 v hf generators are under construction for use in metallurgical smelters. Many technical problems are being met in the construction of large generators, such as the three 4,800 kva, 375 rpm vertical turbogenerators. Until recently, multiple-pole generators had been constructed exclusively with cylindrical poles. The present orders, however, are being filled with oblong poles; this causes a number of technical problems, but the design is much more economical. Similar design is being used in construction of 6,200 kva, 500 rpm hydraulic turbogenerator having a laminated cylindrical rotor instead of distinct poles.

The Kando single-phase, 50-cycle electric locomotives are still in operation on the 16,000 v network, but electrification of the railroads made it necessary to develop a lightweight locomotive without a driveshaft power transmission, capable of greater speeds and suitable for freight service. Since a pole-commutation apparatus cannot be used in motors in which power is applied directly to the separate axles, a method was introduced at the Ganz factory in which the rate of revolution is regulated by varying the frequency. The new modified locomotive weighs 85 tons, and produces 3,200 hp, as compared with the old 98-ton, 2,500 hp model. The main machinery of the new model consists of a phase shifter, frequency converter, and an excitor generator built into one housing and operating on a common shaft. Frequencies of 25, 50, 75, 100, and 125 cycles can be delivered to the five driving motors and, through the selection of wheels of the appropriate diameter, velocities in kilometers per hour corresponding to the frequencies result. Construction of the first locomotive is already far advanced, and in all probability, it should undergo test runs this summer.

A smaller unit for motor coaches has also been developed at the Ganz factory. The 16,000 v of the line are stepped down to operate a motor unit consisting of a single-phase synchronous motor and a dynamo which supplies power for the dc motors attached to the individual axles.

A number of a new series of diesel-electric trains are under construction, each consisting of two motor units and four coaches. The motor unit is powered by a 600 hp diesel engine driving a generator, which supplies two 245 hp dc motors, operating at 730 to 1,800 rpm. The two motor unit cars, located at the front and back of the train, also contain ac generators powered by separate diesel units to supply the auxiliary equipment.

A factor contributing to saving weight in traction motors is the use of glass for insulation. At first, glass cloth had to be imported, but now only the thread is imported, weaving and impregnation being performed within the country.

The nationalization and unification of many smaller factories have made possible the development of medium-sized plants. For example, the following plants were combined to form the Dynamo State Enterprise: the Laub factory; Balogh Reductor Factory; Matyas Rakosi Electromotor Works; United Machine Factory; Watt Electric Motor, Dynamo, and Electrical Equipment Factory; and the Kollector Factory. With the nationalization of the Brown Boveri plant at Budapest, the last capitalist-owned electric motor manufacturing plant in the country has come under planned production, clearing the way for the standardization of manufactured articles.

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